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BROOKS KUSHMAN P.C. 1000 TOWN CENTER TWENTY-SECOND FLOOR SOUTHFIELD, MI 48075				
EXAMINER				
OJURONGBE, OLATUNDE S				
ART UNIT		PAPER NUMBER		
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/551,610

Applicant(s)

SCHEIM ET AL.

Examiner

OLATUNDE S. OJURONGBE

Art Unit

4145

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9-16 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 9-16 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/55/08)
Paper No(s)/Mail Date 20050930
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date ____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. **Claims 9-11, 13 and 16** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kangas et al (WO 96/35458) in view of Butler et al (US 5,110,890), in further view of Whelan (Definitions of Urea and Urethane).

Regarding **claim 9**, Kangas et al discloses a laminated glass (page 31, lines 8-9; page 32, lines 23-24 and 29) comprising:

(A) at least one layer of inorganic or organic glass (page 32, lines 23-24 and 29)
and

(B) at least one layer of one or more polysiloxane-urea copolymer(s) (page 31, line 9; page 5, lines 22-23 and page 6, lines 26-28) prepared by reacting a mixture of :

(a1) linear polysiloxanes of the formula (1)
$$\text{Q-T-SiR}_2\text{O-(SiR}_2\text{O)}_n\text{-SiR}_2\text{-T-Q}$$
 (page 12, lines 8-14)
in which :

Q is NH-R (see H-N-D, page 11, lines 12-14)

T is a divalent hydrocarbon radical having 1 to 20 carbon atoms, (see Y, page 11, lines 12-14 and page 10, lines 25-27)

R is a monovalent, optionally fluorine-, substituted hydrocarbon radical having 1 to 20 carbon atoms, (page 11, lines 12-14 and page 10, lines 3-18)

R1 is hydrogen or a monovalent hydrocarbon radical having 1 to 20 carbon atoms, (see D, page 11, lines 12-14 and page 10, lines 28-30)

n has the value 0 or integral values from 1 to 1000 (see x, line 14).

Regarding (a2), Kangas et al discloses the composition of their invention further comprising functional or non-functional silicate resins of different structural units, including MQT resins. (page 16, lines 1-7).

Although Kangas et al does not explicitly disclose the structural units of the MQT resins as claimed in the instant application, Kangas et al cites Butler et al (US 5,110,890) and discloses that the silicate resins as taught by Butler could be used in the composition of their invention. (page 16, lines 23-26).

Butler discloses a liquid branched polysiloxane (organosiloxane resin) of the formula $[M_xT_yQ_z]_n$.

The M unit of the formula is a monofunctional unit of the formula $R_3SiO_{1/2}$

The T unit of the formula is a trifunctional unit of the formula $RSiO_{3/2}$

The Q unit of the formula is a tetrafunctional unit of the formula $SiO_{4/2}$ (col.1, lines 60-67).

Butler further discloses that the R group represents groups such as organic substituents linked to silicon via a carbon atom having O and/or P or S atoms (col.1, line67-col.2, line 3); and that examples of such organic substituents having O and/or P or S atoms include $-(CH_2)_3OH$ and $-CH_2-C(CH_3)-CH_2OH$ (col.2, lines 50-54).

The branched polysiloxane of the formula $[M_xT_yQ_z]_n$ as disclosed by Butler can be written as $(Q-T-SiR_2O_{1/2})_a (Q-T-SiO_{3/2})_c (SiO_{4/2})_g$

Where :

Q -T is the group containing an organic substituent linked to the silicon via a carbon atom having oxygen atom; example of which is $-(CH_2)_3OH$.

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R is hydrogen, aliphatic or aromatic hydrocarbons, having optionally fluorine or chlorine substituted hydrocarbon radicals with 1 to 20 carbon atoms (col.2, lines 32-49).

The values for a , c and g will be within the range of 4 to 14.

Kangas et al further discloses that the MQ, MQD and MQT resins cited as examples are generally dissolved in solvents before use (page 16, line 18); since the MTQ (MQT) resins disclosed by Butler is liquid at temperatures of 50°C or below (col. 1, lines 54-55), it would have been obvious to one of ordinary skill in the art to have incorporated the MQT resins as disclosed by Butler in the composition of Kangas et al as this eliminates the dissolution step of Kangas et al.

(b) Kangas et al further discloses the composition comprising polyfunctional isocyanates (page 13, line 22- page 14, line 28)

Kangas et al further discloses that the composition contains most preferably, about 30 to 70 parts by weight of the silicate resin (branched polysiloxane).

However, Kangas et al does not explicitly disclose the ratio of NH-R (the amine containing linear polysiloxane) to OH (the hydroxyl containing branched polysiloxane) being selected such that the ratio of the urea groups to urethane groups in the polysiloxane- urea copolymer is at least 4:1.

Whelan evidences that it is known in the art that the reaction of an amine group and an isocyanate group results in the formation of a urea group while the reaction of an alcohol (hydroxyl group) and an isocyanate results in the formation of a urethane group.

Hence, it would have been obvious to one of ordinary skill in the art at the time the invention was made that the higher the ratio of hydroxyl-containing branched polysiloxane to the amine-containing linear polysiloxane in modified Kangas et al, the lower will be the ratio of the resulting urea groups to urethane groups in the polysiloxane-urea copolymer.

Kangas et al further discloses that the silicate resin content (hydroxyl containing branched polysiloxane), amongst other variables influences the physical properties of the resulting composition; such physical properties includes the temperature at which the glassy to rubbery transition occurs. (page 15, lines 22-25)

Since the instant specification is silent to unexpected results, the NH-R : OH ratio in the composition is not considered to confer patentability to the claims; as the temperature at which the glassy to rubbery transition of the resulting polysiloxane – urea composition occurs is a variable that can be modified, among others, by adjusting said NH-R : OH ratio , with said transitional temperature increasing as the amount of OH containing polysiloxane (silicate resin) in the composition increases; the precise NH-R : OH ratio would have been considered a result effective variable by one having ordinary skill in the art at the time the invention was made. As such, without showing unexpected results, the claimed NH-R : OH ratio cannot be considered critical. Accordingly, one of ordinary skill in the art at the time the invention was made would have optimized, by routine experimentation, the NH-R : OH ratio in the composition of Kangas et al to obtain the desired glassy to rubbery transitional temperature, each such optimized ratio would result in a corresponding specific ratio of urea to urethane,

including the claimed ratio of 4:1 (In re Boesch, 617 F.2d. 272, 205 USPQ 215 (CCPA 1980)), since it has been held that where the general conditions of the claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. (In re Aller, 105 USPQ 223).

Regarding **claim 10**, modified Kangas et al discloses all the claim limitations as set forth above and further discloses the laminated glass, wherein T is a hydrocarbon radical having 1 to 6 carbon atoms. (for the linear polysiloxane, see poly(5-hexenyl)methylsiloxane diamine, WO 96/35458, page 13, line 7; for the branched polysiloxane, see $-(CH_2)_3OH$, US 5,110,890, col.2, line 53).

Regarding **claim 11**, modified Kangas et al discloses all the claim limitations as set forth above and further discloses the laminated glass, wherein R is a monovalent alkyl radical having 1 to 6 carbon atoms or a phenyl radical. (for the linear polysiloxane, see methyl radicals, page 10, line 16; for the branched polysiloxane, see methyl, US 5,110,890, col.2, line 45).

Regarding **claim 13**, modified Kangas et al discloses all the claim limitations as set forth above and further discloses a process for the production of the laminated glass, comprising: preparing a polysiloxane-urea copolymer in a first step by reacting a mixture of linear polysiloxanes (a1), branched polysiloxanes (a2) and polyisocyanates

(b) (page 51, line 18-24), and applying the polysiloxane-urea copolymer in a second step to at least one layer of polyethylene terephthalate film (page 52, line 2-4).

Though Kangas et al does not explicitly disclose that the polysiloxane- urea copolymer is applied to an organic or inorganic glass, Kangas et al further discloses that the layer of their invention may be glass (page 32, lines 23-29).

Regarding **claim 16**, modified Kangas et al discloses all the claim limitations as set forth above and further discloses the process, wherein the reaction in the first step is effected in an extruder (page 51, lines 18-26), and the polysiloxane-urea copolymer formed is then extruded directly as a strand.(page 52, line 1).

Though modified Kangas et al does not explicitly disclose that the polysiloxane-urea copolymer formed is extruded as a film, it would have been obvious to one of ordinary skill in the art at the time the invention was made that by varying the thickness of the polysiloxane-urea copolymer strand extruded, a film of the polysiloxane-urea copolymer could be produced.

5. **Claims 12, 14 and 15** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kangas et al (WO 96/35458) in view of Butler (US 5,110,890) in further view of Whelan.A (Definitions of Urea and Urethane) as applied to claims 9 and 13 above, in further view of Bandlish et al (US 4,870,150).

Regarding **claim 12, 14 and 15**, modified Kangas et al discloses all the claim limitations as set forth above and further discloses that the composition may further

contain various fillers and property modifiers provided that such fillers and property modifiers are not detrimental to the function and functionality of the final polymer product. (page 19, lines 11-17).

However, modified Kangas et al does not disclose the laminated glass, wherein the polysiloxane-urea copolymer contains adhesion-promoting silanes.

Bandlish et al teaches a coating composition (col.1, lines 1-2) suitable for use on glass (col.1, line 34) comprising a polyisocyanate (col. 3, lines 5-26), an amine functional polymer (see polyamine, col.4, lines 5-56) and a hydroxyl functional polymer (see polyols, col.2, line 62-col.3, line 4). Bandlish further teaches the use of various silanes (col.5, lines 53-col.6, line 11) and exemplified the use of gamma-glycidoxypopyltrimethoxysilane (TABLE II, col.9, lines 38-39) as adhesion-promoters in their invention.

Hence, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated gamma-glycidoxypopyltrimethoxysilane as taught by Bandlish et al, into the composition of modified Kangas et al as an adhesion- promoter, in order to improve the adhesive property of the composition.

Modified Kangas et al further discloses a polysiloxane-urea copolymer formation process in which "other materials" are added to the polysiloxane-urea reactants in the first step (page 22, lines 19-21)

However, modified Kangas et al does not explicitly disclose that adhesion-promoting silanes are added in the first step of the polysiloxane-urea copolymer process.

Adhesion –promoting silanes are not one of the polysiloxane-urea copolymer reactants and as such, can be considered as one of the "other materials", hence, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have added the adhesion-promoting silane to the composition at this step. Further, there is no evidence of record that the addition of the gamma-glycidoxypopyltrimethoxysilane in the first step would have inhibited the subsequent reaction; therefore, there would have been a reasonable expectation of success in adding the gamma-glycidoxypopyltrimethoxysilane in the first step of the method derived from the teachings of modified Kangas et al.

Further, modified Kangas et al does not explicitly disclose the process, in which adhesion-promoting silanes are applied to the polysiloxane-urea copolymer or the inorganic or organic glass or to both the polysiloxane-urea copolymer and the inorganic or organic glass after the first step.

However, modified Kangas et al discloses that various reactants and additives can be added in any order provided the addition of an additive does not interfere with the reaction of the reactants. (page 22, lines 26-28) and that an additive that is particularly reactive with a polyisocyanate reactant would be typically added to the composition after the polysiloxane-urea copolymer reaction (page 22, lines 28-30).

Hence, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have added an adhesion-promoting silane with functional group(s) that would react with the isocyanate of the polysiloxane-urea copolymer reaction to the composition after the first step.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to OLATUNDE S. OJURONGBE whose telephone number is (571)270-3876. The examiner can normally be reached on Monday-Thursday, 7.15am-4.45pm, EST time, Alt Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Basia Ridley can be reached on (571) 272 1453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

O.S.O

/Basia Ridley/
Supervisory Patent Examiner, Art Unit 4145